

Name: Ms E.

Date: _____

Graphing Polynomial Functions Worksheet

For each of the following, a) give the x-intercepts as ordered pairs, b) the y-intercept as an ordered pair and c) find the end behavior, d) find the behavior at each zero, e) the possible number of turning points, and f) graph and label the zeros with (s, t, or cc).

1. $P(x) = x^2(x-2)(x+2)$

$$0 = x^2(x-2)(x+2)$$

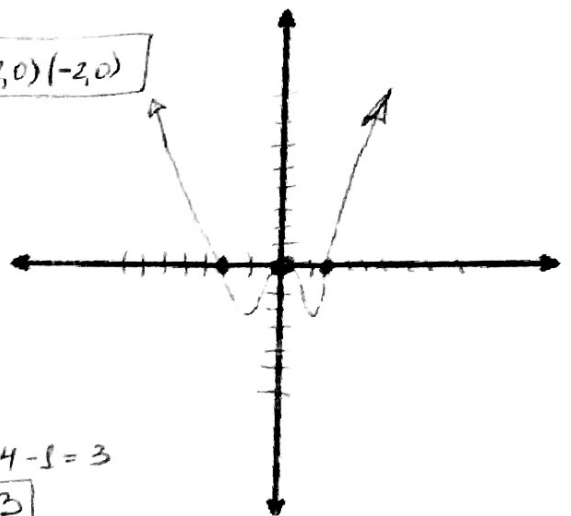
a. x-intercept(s): $x=0$ or $x=2$ or $x=-2 \Rightarrow (0,0), (2,0), (-2,0)$

b. y-intercept: $x=0 \Rightarrow 0^2(0-2)(0+2)=0 \Rightarrow (0,0)$

c. End Behavior: $\text{degree} = 4, a > 0 \Rightarrow \nearrow \nearrow$

d. Behavior at the zeros:
 $x=0$ mult=2 \Rightarrow bounces off of x-axis
 $x=2$ mult=1 \Rightarrow goes through
 $x=-2$ mult=1 \Rightarrow goes through

e. Possible number of turning points: $\text{degree} = 4 \Rightarrow 4-1 = 3$
maximum 3



2. $P(x) = (x-1)(x+3)^4$ $(x-1)(x+3)^4 = 0$

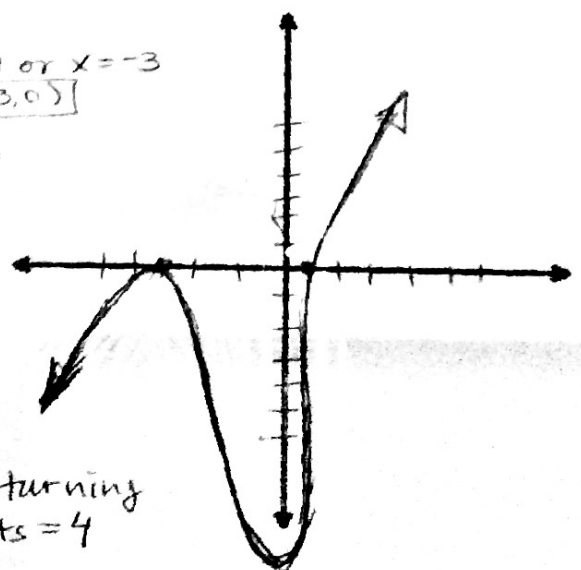
a. x-intercept(s): $x-1=0$ or $x+3=0 \Rightarrow x=1$ or $x=-3$
 $(1,0), (-3,0)$

b. y-intercept: $x=0$
 $(0-1)(0+3)^4 = -1 \cdot 3^4 = -81 \Rightarrow (0, -81)$

c. End Behavior: $\text{degree} = 5, a = 1 > 0 \Rightarrow \nearrow \nearrow$

d. Behavior at the zeros:
 $x=1$ mult=1 \Rightarrow goes through
 $x=-3$ mult=4 \Rightarrow touches x-axis


e. Possible number of turning points: $\text{degree} = 5 \Rightarrow$ max turning points = 4



3. $y = -3(x+1)(x-3)^2(x+2)$

a. x-intercept(s): $(-1, 0), (3, 0), (-2, 0)$

b. y-intercept: $-3(0+1)(0-3)^2(0+2) \Rightarrow -54 (0, -54)$

c. End Behavior: $a = -3 < 0$, degree = 4 \Rightarrow 

d. Behavior at the zeros:

$x = -1$ mult. = 1 \Rightarrow goes through

$x = 3$ mult. = 2 \Rightarrow bounces off of x-axis

$x = -2$ mult. = 1 \Rightarrow goes through.

e. Possible number of turning points: $\text{degree} = 4 \Rightarrow$

max. turning points = 3.

